

APPARATUS AND METHOD FOR AN ULTRASONIC MEDICAL DEVICE  
OPERATING IN TORSIONAL AND TRANSVERSE MODES

ABSTRACT

5       The present invention provides an apparatus and a method for an ultrasonic medical device operating in a torsional mode and a transverse mode. An ultrasonic probe of the ultrasonic medical device is placed in communication with a biological material. An ultrasonic energy source is activated to produce an electrical signal that drives a transducer to produce a torsional vibration of the ultrasonic probe. The torsional vibration produces a  
10 component of force in a transverse direction relative to a longitudinal axis of the ultrasonic probe, thereby exciting a transverse vibration along the longitudinal axis causing the ultrasonic probe to undergo both a torsional vibration and a transverse vibration. The torsional vibration and the transverse vibration cause cavitation in a medium surrounding the ultrasonic probe to ablate the biological material.